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Attempts to Reduce Elopement Using Blocking, a Time-Out Procedure, and Differential Reinforcement

Sydney M. Harbaugh
Western Michigan University, sydney.m.harbaugh@gmail.com

ATTEMPTS TO REDUCE ELOPEMENT USING BLOCKING, A TIME-OUT PROCEDURE, AND DIFFERENTIAL REINFORCEMENT

by

Sydney M. Harbaugh

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Doctoral Committee:

Richard W. Malott, Ph.D., Chair
Kelly T. Kohler, Ph.D.
Ron Van Houten, Ph.D.
Steven Ragotzy, Ph.D.
Carmen Jonaitis, Ph.D.

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I must express my gratitude to Cooper and his family for their participation in this study. They were the inspiration for this project and nothing short of a joy to work with.

Finally, I would like to thank my family for always encouraging me to chase the dream and for their steadfast support. I would not be where I am today without them.

Sydney M. Harbaugh

ATTEMPTS TO REDUCE ELOPEMENT USING BLOCKING, A TIME-OUT PROCEDURE, AND DIFFERENTIAL REINFORCEMENT

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The current study was designed to replicate and extend the results of Harbaugh, Kohler & Malott, 2016, to decrease elopement and flopping by a child diagnosed with autism. The intervention in the present study consisted of a package combining differential reinforcement, response blocking, and a time-out procedure. Following successful reduction in the rate of elopement, a Behavioral Skills Training program was implemented with the child's family to ensure generalization and maintenance of appropriate walking.

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INTRODUCTION

Elopement is a dangerous behavior that is more prevalent in the developmentally delayed population (Jacobson, 1982). Elopement is typically defined as repeated attempts to leave areas without permission or supervision (Bodfish, 1992). Such behavior could lead to dangerous consequences such as suffocation, drowning, and traffic injuries (Anderson et. al, 2014). Elopement often interferes with learning opportunities and skill acquisition and could lead to social isolation for the individual and their family. A study using an online questionnaire to collect parent-reported data showed that nearly half of the children with an autism-spectrum diagnosis elope, and more than half of these children go missing for extended periods of time. Elopement occurred at the highest frequency around the age of five. Of those reporting on five-year-olds, 29% of the parents said their child attempted to elope multiple times a day, and 62% reported that elopement concerns prevented the family from attending or enjoying activities outside of their home (Anderson et al., 2014).

Most interventions studied for elopement include time-out for elopements, differential reinforcement, and access to less restrictive environments contingent on the absence of elopement (Piazza, 1997). Garner (1991) and Chambers et al. (1980) are examples of these types of interventions; however, in each case the studies are limited in that functional control was not demonstrated. Piazza (1997) notes the difficulties of conducting a functional analysis for elopement. These limitations include difficulties regulating consequences due to the dangerous nature of elopement; preventative measures are required when elopement occurs, and they might interfere with the validity of the functional analysis. A review published by Lang et al. (2009) also identified the need to establish an effective and safe method of functional analysis for elopement as a direction for future research.

An additional study conducted by Kodak, Grow, and Northup in 2004 used non-contingent attention combined with a time-out procedure to decrease elopement in an outdoor setting with a five-year-old diagnosed with attention deficit hyperactivity disorder. Treatment consisted of praise and tickles delivered approximately every 15s and a 30s time-out, contingent on elopement; this resulted in low levels of elopement, with no elopement occurring during the last six sessions (Kodak et al., 2002).

Another study conducted by Call et al., (2011) compared the use of differential reinforcement with and without blocking. This study suggested blocking may be an essential component in the treatment of elopement for individuals with autism.

The current study involved a treatment package consisting of differential reinforcement, blocking, and time-out to reduce the frequency of elopement and flopping for a child with autism. A response-cost protocol was also implemented to decrease inappropriate walking in parking lots. In addition to the goal of decreasing elopement and flopping, this study aimed to train the participant's caregiver in the implementation of the protocol and to achieve generalization in the behavior change established.

Allen and Warzak (2000) noted that, applied behavior analysts have established effective interventions for children; however, the success of these interventions lies within the precise delivery by clinicians as well as the child's parents or caregivers. Unfortunately, parental adherence is a challenge for many behavior analysts. Allen and Warzak suggest that skill complexity is a great predictor of parental adherence to protocols and recommend that clinicians develop interventions that are less complex. The present study strived to develop a protocol to decrease elopement and flopping that could be implemented with ease by any potential caregivers that the participant might spend time with.

Adherence problems may also arise in situations where good instructional technology is lacking. This study utilized a behavior skills training approach including verbal instructions, succinct written job aids, modeling, rehearsal and feedback until mastery was achieved (Parsons, et.al, 2012).

METHOD

Participant and Setting

Cooper was nine years old. He had some verbal communication skills; however, his articulation was poor, making it difficult for unfamiliar adults to understand him. He had previously received ABA services in a discrete-trial setting; however, at the time of the study, he had not been enrolled in behavior-analytic services for roughly 4 years. He was enrolled full time in a special education classroom at the time of this study, and his parents reported that elopement was a major concern for the family, occurring across all environments.

Due to the dangerous nature of elopement and setting constraints, a formal functional analysis was not possible. Cooper's parents completed the Functional Analysis Screening Tool-Revised (FAST-R), Questions about Behavior Function (QABF), and the Motivation Assessment Scale (MAS) to aid in identification of the function of Cooper's elopement. Results of the FAST-R indicated an automatic positive and social function, while the QABF indicated an automatic positive function in addition to escape. It should be noted that for both the QABF and the FAST-R scores were relatively high across all functions except for automatic negative and tangible. Scores on the MAS indicated a sensory and an attention function for elopement. Scores for these two functions were higher than escape and tangible.

Cooper had previously participated in a research project to decrease his elopement using differential reinforcement, blocking, and a time-out procedure. The intervention was successful

in reducing elopement to near-zero levels; however, those results did not maintain past the 3-month follow up. Over the course of the following 3 years, he grew significantly taller and stronger, presenting further safety concerns for his family. His increased size and speed resulted in his family feeling less confident in their ability for him to be safe outside of his home. His family started to avoid community settings again, and his life became very restricted. At the onset of the present study, the only time Cooper spent outside of his home was at school. (Harbaugh, 2016).

The present study was an extension of the previous one that Cooper participated in, this time involving his mother as a participant. She participated in family training on the protocol using a Behavioral Skills Training approach at the conclusion of the study.

We conducted sessions in various settings (Appendix A). At the start of the study, sessions were at a "big box" store, Sam's Club. This location was used in our previous study, before moving on to busier grocery stores; however, after the first several sessions it appeared that it would be better to move this early part of the intervention to a more controlled environment. Therefore, we conducted sessions in Sangren and Wood Halls at Western Michigan University, followed by the Bernhard Center, before moving back to community locations--Sam's Club, a local walking trail, and Target. In the final phase of the study, generalization was tested at a novel store (Walmart). These community locations were selected by the family based on locations they commonly visited or they would like to visit; however, elopement was a problem across all settings, at the beginning of the present study.

Treatment Integrity

Treatment integrity data were collected during 100% of the family training sessions and were consistently scored at 100%.

Interobserver Agreement

A research assistant collected interobserver agreement data for all sessions with 98.7% agreement.

Independent Variable

Community Outings

A treatment package consisting of differential reinforcement, blocking, and time-out was implemented to decrease elopement and flopping. Reinforcers, determined at the beginning of each session, were delivered an average of every 30-60 seconds; contingent on appropriate walking. If Cooper attempted to elope, the elopement was blocked and a 10-second time-out from walking was implemented. If he flopped, we provided minimal attention held his hand until he stood up. The individual components of the treatment package are explained in detail below.

Parking-Lot Transitions

Instead of using the treatment package utilized during the community outing portion of this study, we implemented a response-cost procedure in parking lots, during transitions to and from the community-outing destinations. This allowed us to continue to hold Cooper's hand to reduce traffic hazards in the parking lot. We played his choice of music while he was walking appropriately. If he yanked on the adult's hand or flopped to the ground the music we paused until he stopped yanking or stood up.

Dependent Variable

Community Outings

The dependent variables in this study were elopement and flopping. Elopements were defined as any time Cooper was outside of an arm's length of the researcher, he could be either walking or running. Flopping was also consequated in the same manner as elopement. Flops were defined as any time any part of his body, except for his feet, was touching the ground.

Parking-Lot Transitions

The dependent variables for parking-lot transitions were yanking on the adult while they were holding his hand, and flopping to the ground. Yanking was defined as any time that Cooper attempted to pull ahead of the researcher with any amount of force. Flops were defined as before.

Materials

We collected frequency data on elopement and flopping using a frequency data sheet (Appendix B). Stopwatches and timers were used to track the intervals for differential reinforcement, session time, and time-out periods. Data were collected on the number of elopements and the number of flops per 10-minute session, by tallying each instance on the data sheet. For the parking-lot procedure, materials included a data sheet for recording the duration of yanking on the researcher and frequency of flops. Additionally, a stopwatch was used to record the total length of the parking lot transition and an iPhone was used to play Cooper's choice of music. Headphones were not utilized as he would not leave them in place.

Procedure

Community Outings

Following baseline, we implemented the differential reinforcement component of the treatment package with blocking of attempted elopements. Sessions were 10 minutes in length

and were typically conducted three at a time. Each session began with the instruction, “Walk closely”. During this phase, elopements were blocked and the instruction, “Walk closely” was repeated, when an elopement occurred. We determined reinforcers by a preference assessment prior to the beginning of each outing and delivered those reinforcers an average of every 30-60 seconds contingent on appropriate walking. After 9 sessions with only the differential reinforcement, there was no substantial change in the frequency of elopement. Therefore, Phase 2 started at session 17; and in this phase differential reinforcement and blocking remained the same; however, elopements were now consequated with a 10-second time-out. The time-out consisted of telling Cooper to, “Wait” and requiring him to stand in place for 10 consecutive seconds before continuing the walk. During these time-out periods he counted out loud along with the researcher, and attention from the researcher was limited.

Parking-Lot Transitions

We collected baseline data on the duration of yanking during each parking-lot transition, as well as the number of flops. During baseline, Cooper yanked for nearly the entire duration of the transitions. For this reason, we measured the duration of the yanking rather than its frequency. After baseline data were collected, we implemented the response-cost procedure. Each transition began with the instruction, “Walk closely” and a song was played while walking to the destination. This song had been previously chosen by Cooper during a preference assessment before exiting the store or vehicle, if he yanked on the researcher the music was paused until the yanking ceased and, the instruction, “Walk closely” was repeated. If a flop occurred the music was paused and the instruction, “Stand up” was repeated until the client stood. Once he was standing we resumed the music.

Family Training

After Cooper met mastery criteria for the two protocols, family training was implemented using a Behavioral Skills Training approach (Parsons, et.al, 2012). His mother participated in the family training, which consisted of three phases: In Phase 1, the researcher and research assistant modeled the protocol for his mother, during the first session. In the following two sessions his mother served as an additional blocker should elopement occur (filling the role previously played by the research assistant). In Phase 2, his mother implemented both the time-out and response-cost protocols independently with the researcher present. In Phase 3, the researcher did not attend the community outings with Cooper and his mother. Instead, a confederate research assistant, unknown to Cooper, followed at a distance to collect data on elopements and flops as well as treatment integrity. We conducted the final sessions of Phase 3 at a store in which the training had never taken place, in order to assess for generalization.

Results

Community Outings

During baseline, elopements averaged 7.88 per 10-minute session. Following six baseline sessions, Phase 1 (differential reinforcement) was implemented. During this phase, the average frequency of elopement increased to 10.7 per 10-minute session (See Fig. 1. for the data from the community outings). At the onset of session 17, Phase 2 was implemented (differential reinforcement with the addition of the time-out protocol). In this phase, the intervention was implemented across multiple settings; and the average number of elopements per 10-minute session decreased to 1.95 and. We reversed to baseline, during sessions 65-67. In these sessions, Cooper's average elopement increased back to 7.6 per 10-minute session. Once the treatment package was back in place, elopements decreased back to an average of 1.5 per 10-minute

session (Figure 1). It should be noted that the settings varied across these sessions, and became more challenging throughout Phase 2. These changes in setting might account for the slight increase in target behavior during the first sessions in the new settings, for example transitioning from Sam's Club to Target (sessions 49 to 50) resulted in an increase in eloping from 0 to 5 elopements (See Appendix A which lists the sessions spent in each setting).

Frequency of flops was also measured. During baseline, Cooper averaged 2.1 flops per 10-minute session. During Phase 1, flops averaged 2 per 10-minute session, and in Phase 2, flops decreased to 0 .2 per 10-minute session. Flops increased back to an average of 3.6 during the return to baseline. And once the treatment package was back in place, flops decreased down to an average of 1.2 per 10-minute session. It should also be noted that sessions 82-97 took place outdoors on a walking trail; and while training at this location, many of the Cooper's flops occurred when an event of interest was present in the environment. The topography of these flops was different from his typical flops as he would sit or kneel, to watch the event, rather than dropping to the ground as he typically did. While walking on the nature trail. he would kneel or sit down if a dog or bike passed him heading in the opposite direction. Once the dog or bike was out of sight, he would resume walking. While these flops met our operational definition and were consequated with the time-out protocol, they appeared to be different in both topography and function.

Parking-Lot Transitions

During baseline, for the parking-lot transitions, Cooper walked appropriately 15.8% of the time; the rest of the time he was either flopping or yanking. The average parking lot transition time was 71 seconds. During baseline, he flopped an average of 0.8 times per transition, ranging from 0-5 flops per transition. Traffic hazards were a serious concern, as he

would attempt to pull himself and the adult holding his hand in front of moving vehicles. Following the implementation of the response cost protocol, during parking-lot transitions, appropriate walking increased to 98.59% of the time, with an average transition time of 57 seconds; and flops reduced to 0. During sessions 15 and 16, we returned to baseline; and appropriate walking decreased to 27.3% of the time with an average transition time of 66.5 seconds. After returning to the response-cost protocol, appropriate walking increased to 97.02% and flops averaged 0.09 per transition. The average transition time was 82.04 seconds (Figure 2). It should be pointed out that while the average transition time, may be somewhat indicative level of performance, it may also be influenced by the distance between the store and the vehicle.

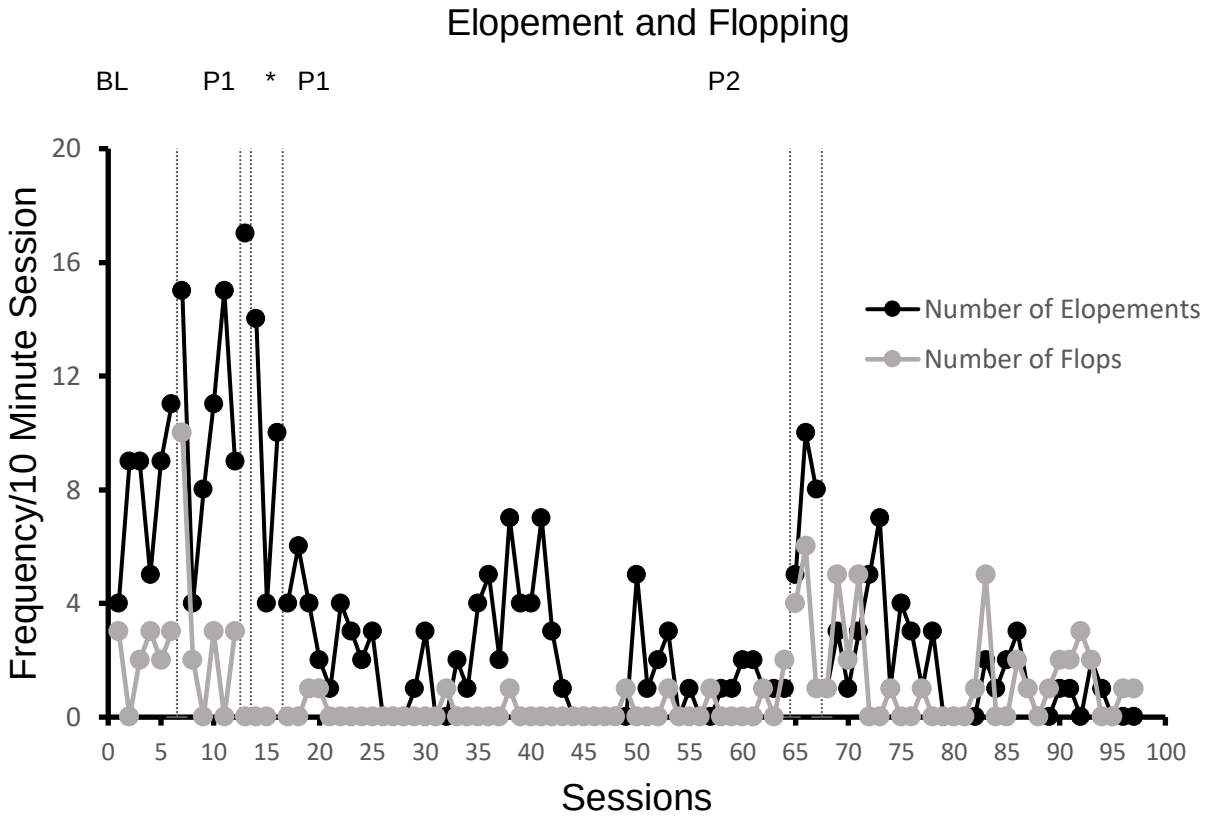

Figure 1. Results of the treatment package on elopement and flopping in community settings. Phase 1: Differential Reinforcement + Blocking. *: Baseline Probe. Phase 2: Differential Reinforcement, Blocking, and Time-Out Procedure.

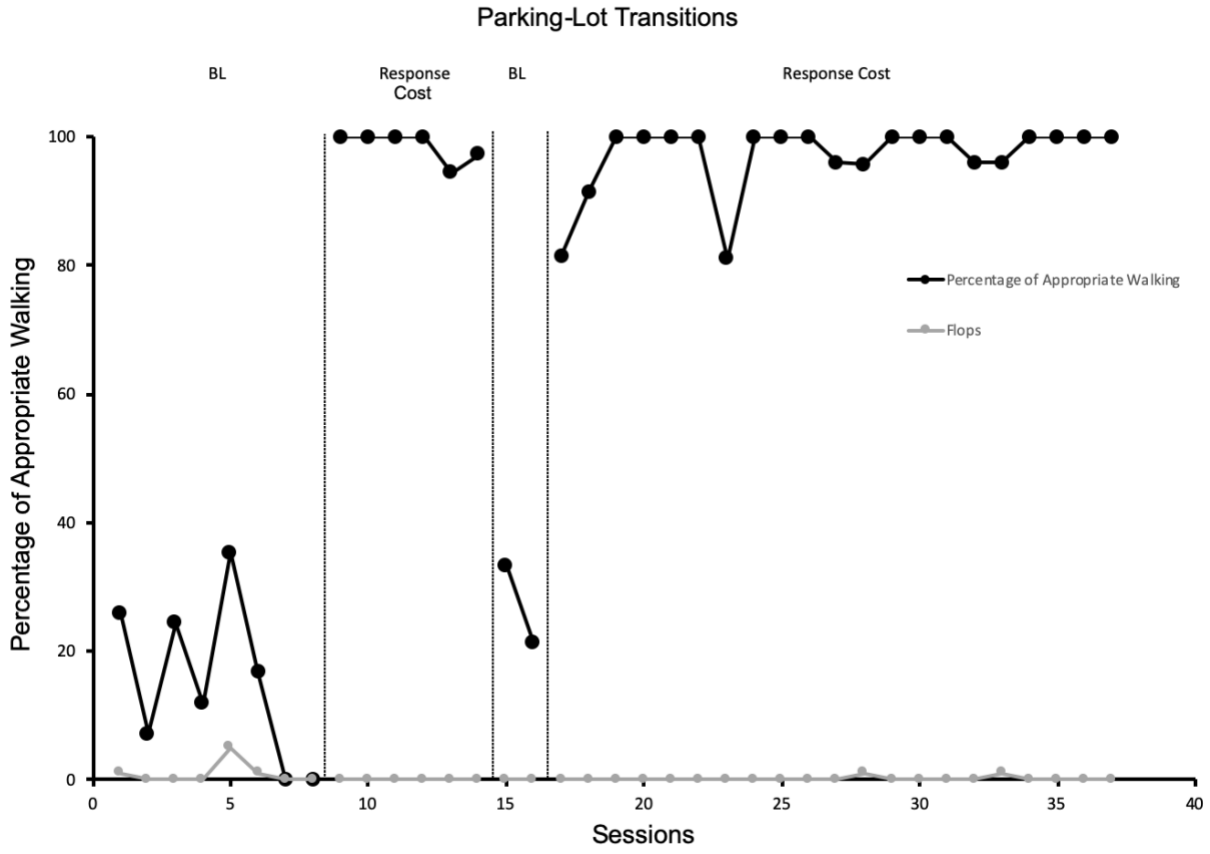

Figure 2. Results of the response-cost protocol for parking-lot transitions.

Family Training

Community Outings

During Phase 1 of family training, the researcher continued to implement the protocol, modeling for Cooper's mother while she was walking on his other side; and he did not engage in any elopement and averaged only 0.66 flops per session. During Phase 2, when his mother implemented the protocol with the researcher present, he averaged 0.15 elopements per session and 0.2 flops. Phase 3 consisted of 8 sessions including tests for generalization, without the researcher present. He did not elope or flop during Phase 3 (Figure 3). The generalization test was conducted at Walmart, a location not previously visited during training.

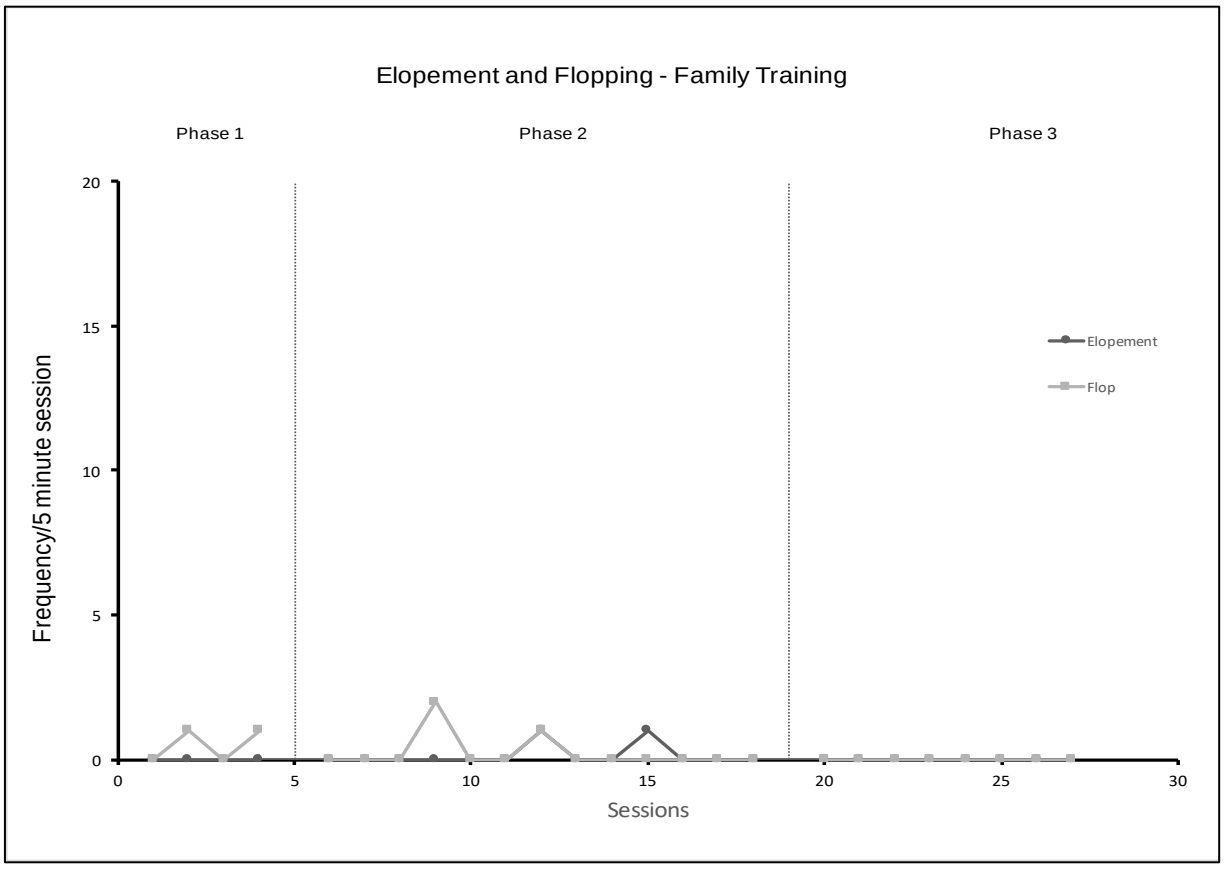

Figure 3. Results of the treatment package on elopement and flopping during family training. Phase 1: Researcher modeled protocol for the parent. Phase 2: Parent implemented protocol with researcher present. Phase 3: Parent implemented protocol in the absence of the researcher.

Parking-Lot Transitions

During Phase 1 of the parking-lot-transition family training, the researcher modeled the protocol for Cooper's mother. Cooper walked appropriately 100% of the time and transition duration averaged 103 seconds. In Phase 2, while his mother implemented the protocol with the researcher present, he walked appropriately 98.46% of the time, during parking-lot transitions, with an average duration of transition being 69 seconds. No flops occurred in Phase 1 or 2. During Phase 3 he walked appropriately with his mother, without the researcher present, 100%

of the time in the parking lot and did not flop (Figure 4). Transition duration averaged 50 seconds.

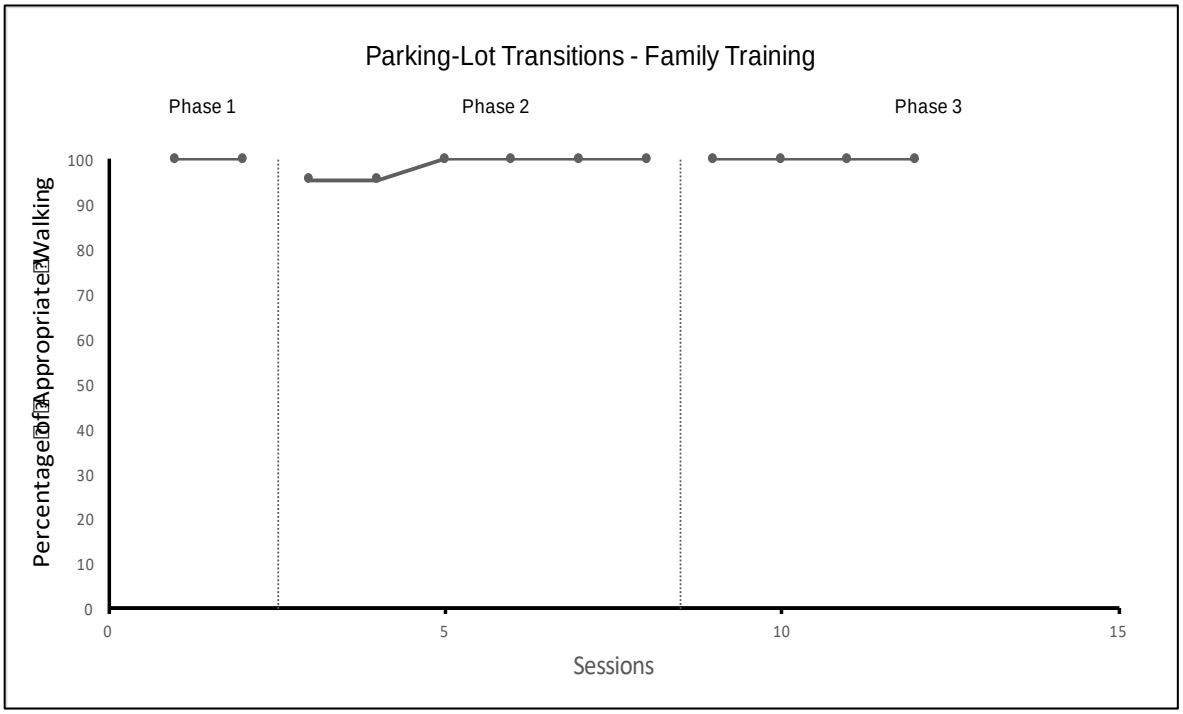

Figure 4. Results of the response-cost protocol during parking lot transitions during family training. Phase 1: Researcher modeled protocol for the parent. Phase 2: Parent implemented protocol with researcher present. Phase 3: Parent implemented protocol in the absence of the researcher.

DISCUSSION

Research on the treatment of elopement is still limited, and even more so in the case of automatically maintained elopement (Boyle & Adamson, 2017). While many of the published treatments have been effective in decreasing the undesirable behavior, they lack in ease of implementation. The present study sought to develop an effective intervention for elopement that could be easily implemented by the child's caregivers in the natural environment, at the conclusion of the study.

In addition to a decrease in elopement, flopping, and inappropriate walking in parking lots, there was a decrease in the number of times per outing that Cooper would touch people that he walked by while in community settings. While data were not collected on these instances throughout the study, anecdotally there was great improvement. At the start of the study he would touch others at the store frequently, we would remind him to have "quiet hands" when approaching others. By the end of the study he was no longer touching others and reminders were no longer necessary.

As mentioned previously, Cooper engaged in flops on the walking trail that appeared to be of a different topography and function than those he typically engaged in. In these instances, he would sit or kneel to watch an event of interest. Further treatment for him should address these types of flops; perhaps using functional communication training to teach more appropriate mands to remain in an area of interest.

The present study was only conducted with one participant. Future research would benefit from replicating this study with other children. Additionally, while the study utilized functional behavior assessment interviews, a formal functional analysis was not conducted. A functional analysis was not feasible due to the same restraints noted by Piazza (1997). These included difficulties regulating the typical consequence of elopement safely and threats to external validity due to the settings in which the functional analysis would have been conducted to limit potential safety concerns. In addition to the functional behavior assessment interviews we drew upon information obtained in the previous study that Cooper participated in to decrease elopement (Harbaugh, 2016). In that study, we accompanied him to an outdoor track with a fence around the perimeter. During this five-minute session we did not interact with him and only

observed his behavior in the absence of any programmed consequences. He ran in the fenced area the entire time, supporting the hypothesized automatic function.

An additional limitation to the present study is that the treatment package was not modified to assess its effectiveness without the differential reinforcement component. Should low levels of elopement have maintained in the absence of the differential reinforcement component the intervention could have been modified to be easier yet for the caregivers to implement.

Finally, Cooper was generally compliant with instructions given by caregivers; so in this context, he readily stood in place for the time-out procedure without additional prompting. Future research would benefit from examining the effectiveness of this intervention with a child who may not comply with instructions as readily as Cooper.

Following the conclusion of this study, Cooper's mother described her feelings regarding the intervention as positive. The success during family training sessions made a large impact on the family and left Cooper's mother with a desire to teach his younger sister to be involved in the protocol and also gave her more confidence in trying to find ways to practice other community outings, for example they went out to dinner and also to the zoo.

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Appendix A

Session Locations

Sessions with Researcher

Session	Location
1-12	Sam's Club
13-15	Wood Hall
16-21	Sangren Hall
22-24	Wood Hall
24-28	Sangren Hall
29-46	Bernhard Center
47-49	Sam's Club
50-81	Target
82-97	Celery Flats Walking Trail

Family Training Sessions

Session	Location
1-6	Celery Flats Walking Trail
6-20	Target
21-24	Walmart/Test for Generalization

Appendix B

Frequency Datasheet

Date:______________________

Session Number (10 minute)	Number of Elopements/Attempts	Start Time/End Time	Number of Flops
Session 1			
Session 2			
Session 3			

Date:______________________

Session Number (10 minute)	Number of Elopements/Attempts	Start Time/End Time	Number of Flops
Session 1			
Session 2			
Session 3			

Date:______________________

Session Number (10 minute)	Number of Elopements/Attempts	Start Time/End Time	Number of Flops
Session 1			
Session 2			
Session 3			

Date:______________________

Session Number (10 minute)	Number of Elopements/Attempts	Start Time/End Time	Number of Flops
Session 1			
Session 2			
Session 3			

Appendix C

HSIRB Approval Letter

WESTERN MICHIGAN UNIVERSITY

Institutional Review Board
FWA00007042
IRB00000254

Date: December 3, 2018

To: Richard Malott, Principal Investigator
Kelly Kohler, Co-Principal Investigator
Sydney Harbaugh, Student Investigator for dissertation

From: Amy Naugle, Ph.D., Chair

Re: IRB Project Number 18-07-16

This letter will confirm that your research project titled "Attempts to Reduce Elopement Using Blocking, a Time-Out Procedure, and Differential Reinforcement" has been **approved** under the **full** category of review by the Western Michigan University Institutional Review Board (IRB). The conditions and duration of this approval are specified in the policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note: This research may **only** be conducted exactly in the form it was approved. You must seek specific board approval for any changes to this project (e.g., ***you must request a post approval change to enroll subjects beyond the number stated in your application under "Number of subjects you want to complete the study"***). Failure to obtain approval for changes will result in a protocol deviation. In addition, if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the IRB for consultation.

Reapproval of the project is required if it extends beyond the termination date stated below.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: **August 14, 2019**

Office of the Vice President for Research
Research Compliance Office
1903 W. Michigan Ave., Kalamazoo, MI 49008-5456
PHONE: (269) 387-8293 FAX: (269) 387-8276
WEBSITE: wmich.edu/research/compliance/hsirb

CAMPUS SITE: Room 251 W. Walwood Hall